

Landesberg (M)

ON THE  
ETIOLOGY AND PROPHYLAXIS  
OF  
BLINDNESS.

BY  
DR. M. LANDESBURG, PHILADELPHIA.



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*Reprinted from the ARCHIVES OF OPHTHALMOLOGY AND OTOTOLOGY, Vol. 6,  
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## ON THE ETIOLOGY AND PROPHYLAXIS OF BLINDNESS.

BY DR. M. LANDESBURG, PHILADELPHIA.

My present treatise is based upon a material of 8,767 eye-patients, who came under my observation in the course of seven years. The material belongs, with some exceptions, to both the cities of Elberfeld, Barmen, and to neighboring districts of Rhineland and Westphalia. We see accordingly that this material of eye-patients is collected from very populous districts of Germany, chiefly engaged in manufacture and commerce. Of these 8,767 eye-patients, there are 580 cases of blindness, each case being counted but once. The word "blindness" is employed in a very restricted sense. Only such cases are taken into consideration here whose sight was lost without any hope of recovery. There remained excluded from the present consideration, 1st, all those cases in which the *prognosis* of amaurosis was admissible, but which still retained a certain amount of vision either at the time of first examination or discharge; 2d, such cases as were blind at the time of first examination, but whose sight was or could be restored by treatment, either entirely or in part. Thus I have omitted from consideration all cases of detachment of retina, of atrophy of optic nerve, the morbid process of which was not yet completed, although total blindness was on y a question of time. Likewise have been omitted all uncomplicated cataracts (congenital as well as acquired) which admitted of a good prognosis.

The loss of material incurred by such a process of elimination is slight in comparison with the gain in correctness, which enables us to give full latitude to the purposes entertained in this treatise. It is not my intention to furnish statistical material only. I desire *to contribute to the knowledge of the causes of blindness, and to state the measures of preventing them.*

Of the questions which I endeavored to answer, I should have wished to consider those which refer to the period of blindness, and to the length of time elapsed from the beginning to the final issue of the morbid process. But I was obliged to give up this intention. As it is very difficult to obtain from the patient reliable information on these points, my records were insufficient, and did not present that accuracy which is the first condition of scientific investigation.

I classified the cases according to their etiology, dividing accordingly into single sections the numbers of the cases of blindness. To each section I added such comments and criticisms as seemed necessary. The patients I separated into men, women, and children; the latter up to their sixteenth year of age. Of married women without any trade, I stated the business of their husbands; of children without trade, the business of their fathers.

Under the head of "*Unknown Causes*" summed up all those cases of blindness the etiology of which could neither be ascertained from the patient nor be elicited by immediate investigation, or where the inquiry after the etiology had been omitted in my diary.

Under the head of "*Final Results*" I give the description of the blind eye as I entered it in my records.

The causes of the 580 cases of blindness are :

#### A.—*Affections of the Conjunctiva.*

The different forms of conjunctival affections caused 48 cases of blindness, viz. :

1. *Granular conjunctivitis*, with its consecutive morbid processes, as distortion of tarsus, entropion, trichiasis, pannus led to blindness in 26 cases, of 12 men and 14 women.

##### *Of the men there were :*

Farmers, . . . . .	2	Cigar-store keeper, . . . . .	1
Laborers, . . . . .	3	Organ grinder, . . . . .	1
In almshouse, . . . . .	1	Shoemakers, . . . . .	2
Hatter, . . . . .	1	Retailer, . . . . .	1

*There were blind:* of both eyes, 1 (in the almshouse); of the right eye, 4; of the left, 7.

*The ages were :*

From 16 to 30 years, . . . . . 2	58 years old, . . . . . 1
“ 31 to 45 years, . . . . . 8	73 years old, . . . . . 1

*Of the women there were :*

Carpenter's daughter, . . . . . 2	Plumber's daughter, . . . . . 1
Factory girls, . . . . . 3	Tailor's daughter, . . . . . 1
Workmen's wives, . . . . . 2	Servant girl, . . . . . 1
Charwoman, . . . . . 1	Joiner's wife, . . . . . 1
Huckster's wife, . . . . . 1	Farmer's daughter, . . . . . 1

*There were blind:* of both eyes, 1 (charwoman); of the right eye, 6; of the left eye, 7.

*The ages were :*

From 16 to 30 years, . . . . . 8	From 46 to 60 years, . . . . . 3
“ 31 to 45 years, . . . . . 3	

*Final Result :*

Stump of the eyeball, in 5 cases.	irido-choroiditis absoluta, in 6 cases.
Pannus, irido-choroiditis absoluta, in 3 cases (of both eyes in one case).	Total leucoma of the cornea, irido-choroiditis absoluta (of both eyes in one case), in 3 cases.
Pannus, phthisis of the eyeball, in 2 cases.	Total leucoma of the cornea, sympathetic irido-choroiditis, in 3 cases.
Total leucoma of the cornea, atrophy of the eyeball, in 4 cases.	
Opaque staphyloma of the cornea,	

2. *Blennorrhoeic conjunctivitis* caused blindness in 6 cases, in 4 men and 2 women.

*Of the men there were :*

Fireman, . . . . . 1	Laborer, . . . . . 1
Weaver, . . . . . 1	Mason, . . . . . 1

*The ages were :*

Between 16 and 30 years, . . . . . 3	41 years old, . . . . . 1
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*There were blind:* of both eyes, 1 (weaver); of the right eye, 2; of the left, 1.

*Of the women,* one, a servant girl, 23 years old, was blind of



both eyes; the other, a factory girl, 18 years old, of the left eye.

### Final Result :

Total leucoma of the cornea, atrophy of the eyeball, in 1 case.	Phthisis of the eyeball (of both eyes in two cases) in 5 cases.
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3. *Diphtheritic conjunctivitis* led to blindness of both eyes of a carpenter's child, 4 years old, through suppuration of both corneæ and consecutive panophthalmitis.

4. *The Blennorrhœa of new-born infants* led to blindness of 15 children, of whom 9 lost both eyes, 4 the right, and 2 the left eye.

### The ages were :

One week, . . . in 1 case	Eight weeks, . . . in 1 case
Two weeks, . . . in 5 cases	Nine weeks, . . . in 1 "
Three weeks, . . . in 2 "	Five years, . . . in 1 "
Five weeks, . . . in 1 case	Eleven years, . . . in 1 "
Six weeks, . . . in 1 "	Fifteen years, . . . in 1 "

### There were :

Workmen's children, . . . 2	Plumber's child, . . . 1
Tailors' children, . . . 2	Officer's child, . . . 1
Shopkeepers' children, . . . 2	Farmer's child, . . . 1
Weavers' children, . . . 2	Laborers' children, . . . 3
Brushmaker's child, . . . 1	

### Final Result.

Total leucoma of the cornea, buphthalmus, ciliary staphyloma (of both eyes), in 1 case.	Total leucoma of the cornea, atrophy of the eyeball, in 3 cases.
Suppuration of the cornea (of both eyes), in 6 cases.	Opaque staphyloma of the cornea, irido-choroiditis absoluta, in 1 case.
Stump of the eyeball (of both eyes in one case), in 12 cases.	Phthisis of the eyeball (of both eyes in one case), in 2 cases.

Of the affections of the conjunctiva causing blindness, granular conjunctivitis attracts first our attention. This form of disease caused blindness in more than one-half of the conjunctival cases. These great losses of vision are not attributable to the nature of the morbid process itself. The most severe forms of granular conjunctivitis admit generally of favorable prognosis, if properly treated. There must be pecu-



liar causes for such abnormal losses. The facts are as follows: In the "Wupperthal" and in the adjacent districts of Rhineland and Westphalia, where my observations have been made, the granular conjunctivitis is an endemic affection, not exempting any class of society, and spreading equally over low and high lands, over dense centres of population as well as over the country. Whether the spread of this affection is influenced by certain conditions of climate is still an open question. I was by no means able to confirm the suggestion of Mooren (Dusseldorf) that the acute granulosis is especially favored by cold, damp weather. In my district I observed this form of disease in equal frequency at all seasons.

Respecting the ages of the patients, I seldom saw children under five years suffering from granular conjunctivitis. But from this period upwards all ages are to be found, with nearly the same percentage for both sexes.

While all classes of people are nearly equally liable to granulosis, the further course of this affection is influenced by exterior circumstances to which the patients are subjected. In the wealthy classes of society, where competent medical help is called upon in the first beginnings of the affections, the granulosis always is a tractable disease. Serious consequences for the eye are hardly ever observed. In the middle classes, the sad consequences of granulosis are oftener met with, and become increased as we descend to the lower grades of society. Carelessness and impatience on the part of the sufferers are the principal causes of this state of affairs. In all the cases where the course of granular conjunctivitis is latent, medical help is sought very late. The morbid process advances but slowly, the cornea remains intact for years, and only the increasing swelling of the eyelids and a discomfort of the patient induces him to seek medical assistance. But even the advice of the attending physician is but little heeded; vision not being impaired, the patient considers his affection as very slight. The treatment is either neglected if there is any improvement, or abandoned if, after some time, no evident result is obtained. In the mean time the patient changes his physician or

employs some domestic remedy. Thus the affection progresses; the cornea becomes involved, which, in many cases, finally results in blindness. The case does not stand much better with the acute granular conjunctivitis. As so many patients belong to the working classes, with whom suspension of work is synonymous with trouble and want, the eyes cannot be spared, the affection assumes a chronic character, ending with loss of vision in many cases, because the treatment is inadequate.

If, on the one hand, we are compelled to charge the social conditions to which the patients are subjected with the very serious consequences of a disease by no means of malignant character, we must, on the other hand, blame some methods of treatment in use *for aggravating this otherwise mild affection*. I consider the method of giving to the patients or to their relatives a crayon of sulphate of copper with the advice of touching the eyelids themselves, as entirely objectionable. Owing to the ignorance or unskilfulness of the patients, the crayon cannot be used with advantage, and often aggravates the disease. The conjunctiva of the eyelids becomes destroyed; cicatrices of the tissue are formed, giving rise to trichiasis and entropion. A method much in vogue in Rhineland against entropion and trichiasis is, in my estimation, not a small source of so many cases of granulosis ending in blindness. It is the following: *To cut out of the eyelids simply a horizontal skinflap, and to repeat this excision as often as a relaxation of the cicatrix reproduces the previous entropion position*. This method is very enticing to the patient, because it can be resorted to in out-door practice, and an immediate result is always certain. If the affection returns some time afterwards, the repetition of the excision is submitted to the more willingly, as the patient has experienced its favorable effect before. At last there is left no more skin for excision, and to the old affection there are added those inconveniences which are caused by lagophthalmus.

According to our statistics, we have to regard *blennorrhœa of new-born infants* as one of the most dangerous forms of disease of the eye. In the percentage of losses second to the granular conjunctivitis, this form is the first among the affections of the

conjunctiva in regard to its malignant nature. While granular conjunctivitis gives of 26 cases of blindness only 2 of both eyes, blennorrhœa of new-born infants shows of 15 cases of blindness 9 of both eyes. This great figure of losses also is not the consequence of the nature of the affection. The blennorrhœa of new-born infants is from the beginning not a malignant disease. Watched in its first symptoms, it affords a favorable prognosis and a certain cure. The principal cause of the morbid process involving such serious consequences is here also neglect and improper treatment. Slight affections of the conjunctiva, which stop either without any treatment or in consequence of a mild astringent, occur so often with babes, and the parents are so accustomed to them, that they are only regarded as a harmless affair. If the affection takes a more serious course, the midwife is ready with her advice, and the mother's anxiety is quieted, hearing similar cases cited which have been cured in a short time by the same treatment. Even in the wealthy families the family physician is rarely called in in the beginning of the disease. There, too, the midwife wields the sceptre, while in the lower classes her rule is tyrannical. It is one of the saddest experiences of the oculist when, seeing such cases ruined by criminal carelessness, he hears the old and always-repeated answer: The child has been most carefully treated with warm poultices, according to the advice of the midwife, backed by the advice of good lady friends.

Of these 15 children, 3 came to me at more advanced ages, viz.: 1st, a boy, 15 years old, with total leucoma of the cornea of both eyes; 2d, a girl, 5 years old, with total leucoma of the cornea and atrophy of the left eyeball; 3d, a girl, 11 years old, with stump of the right eyeball. The other children I saw between the first and ninth week of birth.

In the 8 cases of blindness of both eyes, the suppuration of the cornea was so far advanced at the time of the first examination that there were no means of checking the morbid process. In 7 cases, the previous treatment had for the most part been left to the midwife. But even where a physician was called in, no competent treatment had been employed.



In the cases of monocular blindness, the cornea of the other eye was likewise affected at the time of the first examination. In 3 cases, the vision was restored to its normal state. In a fourth case, where we had to deal with opaque staphyloma of the cornea and buphthalmus of the left eye, and with central leucoma of the cornea and anterior synechiæ of the right eye, the latter regained a certain part of vision after iridectomy.

In regard to blennorrhœic conjunctivitis, I have to say that, in the case of blindness of both eyes (weaver), the blennorrhœa has been developed from a simple conjunctivitis, through neglect and bad treatment. As the patient suffered from a slight inflammation of the conjunctiva, I prescribed a solution of sulphate of zinc; but, upon the advice of an old woman, he applied hot poultices to both eyes for several days in succession. The appearance of violent suppuration was looked upon as a salutary crisis. When I saw the patient, ten days afterwards, both corneæ were totally destroyed by the suppurative process.

The fireman, a habitual drunkard, was seized, while under my treatment for blennorrhœic conjunctivitis of both eyes, with delirium tremens. Removed to the city hospital, his left eye was lost there, in consequence of suppuration of the cornea.

The case of diphtheritic conjunctivitis was the only one I had the opportunity of seeing in the course of seven years' practice at Elberfeld, notwithstanding diphtheritic affections were not of so very rare occurrence either in Elberfeld or in the adjacent districts. The affection of the eyes was probably caused by infection. A child, five years old, of the same family, was suffering at the same time from diphtheria of the throat, and both children were kept in the same room.

### *B.—The Affections of the Cornea.*

The primary affections of the cornea caused 85 cases of blindness, of 37 men, 29 women, and 19 children.

*Of the men there were :*

Watchman, . . . . .	1	Disabled soldier, . . . . .	1
Masons, . . . . .	9	Farmers, . . . . .	3
File-cutters, . . . . .	2	Turner, . . . . .	1
Shoemakers, . . . . .	2	Upholsterer, . . . . .	1
Smiths, . . . . .	2	Saddler, . . . . .	1
Bookbinder, . . . . .	1	Workmen, . . . . .	5
Cooper, . . . . .	1	Weavers, . . . . .	4
Joiners, . . . . .	2	Chimney-sweeper, . . . . .	1

*The ages were :*

From 16 to 30 years, . . . . .	10	From 46 to 60 years, . . . . .	9
" 31 to 45 years, . . . . .	14	" 61 to 75 . . . . .	4

*There were blind :* of both eyes, 3 ; of the right eye, 19 ; of the left eye, 15.

*Of the women there were :*

Workmen's widows, . . . . .	6	Shoemakers' wives, . . . . .	2
Servant-girls, . . . . .	4	Factory women, . . . . .	4
Factory girls, . . . . .	8	Joiner's daughter, . . . . .	1
Washerwomen, . . . . .	2	Merchants' wives, . . . . .	2

*The ages were :*

From 16 to 30 years, . . . . .	11	From 46 to 60 years, . . . . .	6
" 31 to 45 years, . . . . .	7	" 61 to 75 years, . . . . .	5

*There were blind :* of both eyes, 2 ; of the right eye, 14 ; of the left, 13.

*Of the Children there were :*

Laborers' children, . . . . .	4	Tailor's child, . . . . .	1
Plumber's child, . . . . .	1	Farmer's child, . . . . .	1
Weavers' children, . . . . .	4	Joiner's child, . . . . .	1
Stone-cutter's child, . . . . .	1	Washerwoman's child, . . . . .	1
Merchants' children, . . . . .	2	Shoemaker's child, . . . . .	1
Designer's child, . . . . .	1	Butcher's child, . . . . .	1

*The ages were :*

From 1 to 5 years, . . . . .	13	11 years old, . . . . .	1
" 6 to 10, . . . . .	5		

*There were blind :* of both eyes, 1 ; of the right eye, 10 ; of the left, 8.

*Final Result :*

Opaque pyramidal staphyloma of the cornea (of both eyes in two cases), in 10 cases.	Stump the eyeball, in 7 cases.
Atrophy of the eyeball in consequence of perforation of the cornea and prolapse of iris and vitreous (of both eyes in one case), in 5 cases.	Total leucoma of the cornea, staphyloma of the iris, in 4 cases.
Phthisis of the eyeball, with staphyloma of the iris, in 5 cases.	Total leucoma of the cornea, consecutive glaucoma, in 5 cases.
Total leucoma of the cornea (with and without anterior synechiæ), irido-choroiditis absoluta (of both eyes in one case), in 14 cases.	Total suppuration of the cornea (of both eyes in one case), in 8 cases.
Opaque pyramidal staphyloma of the cornea, with consecutive glaucoma, in 5 cases.	Total leucoma of the cornea, atrophy of the eyeball (of both eyes in one case), in 7 cases.
Epithelioma of the cornea, iridocyclitis, in 3 cases.	Panophthalmitis, in 4 cases.
	Buphthalmus, leucoma corn. adhærens, in 4 cases.
	Leucoma corn. adhær., iridocyclitis chronica, consecutive glaucoma, in 3 cases.
	Sclerosis corneæ, consecutive glaucoma, in 1 case.

One child, 18 months old, blind of both eyes, born of a syphilitic mother, showed all signs of hereditary syphilis. The affection of the cornea began with a small central infiltration. The resisting power of the cornea was but very slight. A diffuse suppuration soon set in, leading, in a short time, to maceration of both corneæ.

One of the three cases of epithelioma of the cornea was observed in a chimney-sweeper.

It need not be mentioned that, in these cases also, neglect and carelessness were the chief causes of blindness. Slight forms of keratitis, which, under proper care, might have been cured without any impairment of vision, had often caused the loss of the eye in consequence of neglect. The course of the affection of the cornea was greatly influenced by the season. The spring and summer were the most unfavorable periods. In this time, the tendency of suppuration was common to all affections of the cornea. Even the slightest cases required more than usual care to avoid bad results. Such patients as workmen, stone-cutters, and masons, who were obliged to continue their work



under the injurious influences of their trade, furnished the largest percentage of severe forms of keratitis, resp. of blindness.

*C.—Affections of the Uveal Tract.*

With 58 cases of blindness in 24 men and 34 women.

*Of the men there were :*

Baker, . . . . .	1	Organ-grinders, . . . . .	2
Factorymen, . . . . .	4	Laborer, . . . . .	1
Retired men, . . . . .	2	Butchers, . . . . .	2
Hotel-keeper, . . . . .	1	Smiths, . . . . .	3
Miner, . . . . .	1	Dyer, . . . . .	1
Merchants, . . . . .	3	Tailor, . . . . .	1
Physician, . . . . .	1	Shoemaker, . . . . .	1

*The ages were :*

From 20 to 30 years, . . . . .	3	From 46 to 60 years . . . . .	6
“ 31 to 45 years . . . . .	12	“ 61 to 70 years, . . . . .	3

*There were blind :* of both eyes, 2; of the right eye, 8; of the left, 14.

*Of the women there were :*

Merchants' wives, . . . . .	3	Carpenter's daughter, . . . . .	1
Servant-girls, . . . . .	4	Shoemaker's daughter, . . . . .	1
Workmen's widows, . . . . .	4	Shoemaker's wife, . . . . .	1
Monger's wife, . . . . .	1	Dyers' wives, . . . . .	2
Monger's daughter, . . . . .	1	Locksmith's wife, . . . . .	1
Merchants' widows, . . . . .	2	Weavers' daughters, . . . . .	3
Printer's daughter, . . . . .	1	Farmer's daughter, . . . . .	1
Factory women, . . . . .	8		

*The ages were :*

From 16 to 30 years, . . . . .	6	From 46 to 60 years, . . . . .	16
“ 31 to 45 years, . . . . .	10	“ 61 to 75 years, . . . . .	2

*There were blind :* of both eyes 3; of the right eye, 17; of the left, 14.

*Final Result.*

Irido-choroiditis absoluta, closure of pupil, consecutive glaucoma (of both eyes in two cases), in 8 cases.	Irido-chor. chron., with consecutive cataract and luxation of lens in the anterior chamber, in 3 cases.
Irido-chor. chron. with phthisis of the eyeball (of both eyes in two cases), in 9 cases.	Irido-chor. chron. absol., with formation of pseudo-membranes in vitreous, in 4 cases.
Irido-choroiditis sympathica with consecutive glaucoma (of both eyes in one case), in 5 cases.	Irido-chor. absol., with ossification in the interior of the eyeball and phthisis of the same, in 4 cases.
Irido-choroiditis absoluta, detachment of retina, atrophy of the eyeball, in 6 cases.	Irido-cyclitis, with ossification in the interior of the eyeball, in 3 cases.
Irido-chor. absoluta, closure of pupil, cataracta capsularis, in 5 cases.	Choroiditis serosa, with detachment of retina and phthisis of the eyeball, in 5 cases.
Irido-chor. serosa, with detachment of retina, in 6 cases.	

My experience shows that the female sex is more subject to affections of the uveal tract than the male, and at an earlier age, often in the first years of puberty. The cases of consecutive blindness occur, therefore, earlier with women than with men. While, according to my records, there is no case of blindness in men prior to the 20th year of age, we have 6 cases of blindness in women between the ages of 15 to 30 years, of which 2 cases are of 17 and 19. A highly dangerous form of affection of the uveal tract is the serous irido-choroiditis, to which women of tardy or irregular menstruation are often subject, and which often returns with renewed violence, leading, at last, in many cases, to blindness by detachment of retina. The course of this affection is often very latent. In cases of monocular affection, we have frequent occasion to see the loss of vision, either total or partial, while the patient has no idea that she is affected with an eye-disease. The climacteric process of involution of women is often accompanied by morbid disturbance of the uveal tract, called "*choroiditis plastica*," the prognosis of which, however, is not unfavorable.

Of the girls, there were 4, aged respectively 17, 19, 23, and 24 years, who were laboring under amenorrhœa. Of these, 1

(17 years old) suffered with severe chlorosis, and the 3 others from congestion of the brain, complicated with neuralgia of the head. In no case was there any anomaly of the sexual organs.

Of these girls, three suffered from serous irido-choroiditis of both eyes. The result was: *loss of both eyes in two cases and one eye in one case.* The fourth girl came under my treatment with irido-choroiditis and closed pupil of both eyes. Her right eye only could be saved.

*D.—Affections of the Retina.*

14 cases of blindness were due to affections of the retina, 6 in men and 8 in women.

*Of the men there were :*

Three farmers, aged respectively 35, 41, 46 years.	One private gentleman, 27 years old.
One weaver, 36 years old.	One smith, 46 years old.

*There were blind :* of both eyes, 5 ; of the left eye, 1 (27 years old).

*Of the women there were :*

One baker's wife, 73 years old.	One weaver's wife, 59 years old.
One merchant's wife, 68 years old.	One letter-carrier's wife, 58 years old.
One weaver's daughter, 16 years old.	One monger's daughter, 18 years old.
Two school-teachers' wives, 50 and 51 years old.	

*There were blind :* of both eyes, 2 (the letter-carrier's wife and the monger's daughter) ; of the right eye, 4 ; of the left, 2.

*Final Result :*

Apoplectic retinitis, in 2 cases.	Pigmentary retinitis, with subacute glaucoma of both eyes, in 1 case.
Apoplexy of retina (of both eyes in one case), in 3 cases	
Neuro-retinitis, with hemorrhages of retina (of both eyes in three cases), in 5 cases.	Pigmentary retinitis (of both eyes in two cases), in 3 cases.

The girl, 16 years old, lost her left eye in consequence of apoplectic retinitis, with consecutive atrophy of the optic nerve.



Three months previously, she suffered from severe metrorrhagia. In the mean time the eyes remained perfectly normal. Whether there was any connection between the former metrorrhagia and the subsequent apoplexy must remain an open question.

The girl, 18 years old, lost both eyes in consequence of pigmentary retinitis. She had three brothers, aged respectively 23, 28, and 35 years, and four sisters, aged respectively, 14, 20, 25, and 29 years. Of these, the three brothers and two sisters were suffering, too, from typical pigmentary retinitis, with considerable concentric contraction of the field of vision, and diminution of the central power of vision.

In these cases, the result of examination was as follows :

1. The brother, 23 years old, had vision in both eyes =  $\frac{1}{4}$ . Read Jaeger 4. Could find his way at night.

2. The brother, 28 years old, counted fingers with the right eye at 6 feet ; vision of the left eye =  $\frac{1}{10}$ . Read with the left eye Jaeger 14. Could not find his way at night.

3. The brother, 35 years old, vision of the right eye =  $\frac{1}{2}$ , of the left =  $\frac{1}{4}$ . Read with the right eye Jaeger 16, with the left, Jaeger 7. Could not find his way at night.

4. The sister, 25 years old. Vision of the right eye =  $\frac{5}{10}$ , of the left =  $\frac{5}{10}$ . Read with the right eye Jaeger 10, with the left, Jaeger 18. Could not find her way at night.

5. The sister, 29 years old, counted fingers at 2 feet with the right eye, and at 8 feet with the left. Could read some words of Jaeger 23 with the right eye, and of Jaeger 18 with the left. Atrophy of optic nerve of both eyes. Could even at day-time hardly find her way. Besides, the right ear was totally deaf, and the left one very hard hearing.

The older two sisters and the father had normal eyes. The mother, who died in her last childbed, was said to have been very weak-sighted. There was consanguinity among the parents.

The sister, twenty years old, had been married to her cousin for two years. Her male child, one year old, showed some small star-shaped pigment dots on the periphery of both retinae.

Among the men there were three who had lost their sight by pigmentary retinitis.

1. A farmer, 35 years old, blind of both eyes. There was, besides, a complication of subacute glaucoma of both eyes. The patient is the

youngest of four brothers and sisters, of whom only one sister, with normal eyes, is still living. The others died in their youth, and no satisfactory information could be obtained either respecting the condition of their eyes or of those of their parents, who, too, were dead. Consanguinity of the parents did not exist.

2. A private gentleman, 27 years old, blind of both eyes. He has two brothers, aged respectively 33 and 46 years, and one sister 21 years old. The eldest brother only is suffering from pigmentary retinitis, which affects especially the peripheric parts of the retina. There is concentric contraction of the field of vision, but still a good central vision. Jaeger 3 is read by each eye, and patient is able to find his way at night. The other brother and sister have normal eyes. The parents are dead. The father is said to have been weak-sighted. There was consanguinity of the parents.

3. A farmer, 46 years old, blind of the left eye. The right eye, suffering from highly-developed pigmentary retinitis, has a vision of  $\frac{3}{80}$ , and reads some words of Jaeger 16. Field of vision limited to the fixing point. Can find his way only at day-time, and only in familiar places. He is the only child of first marriage. His mother, who died in consequence of carcinoma of the womb, was weak-sighted during the latter part of her life. There was no consanguinity of the parents. The father, 68 years old, is suffering from immature cataract of the right eye, with good perception of light and good projection. His left eye has a vision of  $\frac{1}{10}$ , with Hm.  $\frac{1}{15}$ , and irregular astigmatism. Background of the eye is normal. Of a second marriage there are three children with normal eyes.

In all the cases of blindness in consequence of apoplexy and hemorrhage of the retina, there was no organic disease.

### *E.—Detachment of Retina.*

This affection caused 38 cases of blindness, 30 in men, and 8 in women.

#### *Of the men there were :*

Carpenter, . . . . .	1	Locksmith, . . . . .	1
Organ-grinder, . . . . .	1	Carpenter, . . . . .	1
Weavers, . . . . .	3	Tailors, . . . . .	2
Merchants, . . . . .	3	Grave-digger, . . . . .	1
Factorymen, . . . . .	4	Baker, . . . . .	1
Clerks, . . . . .	3	Printers, . . . . .	2
In almshouse, . . . . .	2	Dyer, . . . . .	1
House painter, . . . . .	1	Bookkeeper, . . . . .	1
Railroad officer, . . . . .	1	Farmer, . . . . .	1

*There were blind :* of both eyes, 6; of the right eye, 13; of the left, 11.

*The ages were :*

From 16 to 30 years, . . . . . 5	From 46 to 60 years, . . . . . 16
“ 31 to 45 years, . . . . . 7	“ 61 to 65 years, . . . . . 2

The six patients blind of both eyes were aged respectively 40, 47, 48, 59, 60, 65 years.

In two cases of blindness of both eyes, the eyes of the parents and of the brothers and sisters were examined. The result was :

*In the first case :*

1. Father, baker, 68 years old. M.  $\frac{1}{8}$  with V. =  $\frac{1}{16}$  of both eyes. Very large staphyloma posticum and some atrophic spots in choroid.
2. Mother, 65 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Only small circumpapillar choroidal atrophy.
3. Brother, copyist, 26 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes, with small staphyloma posticum and insufficiency of the interni.
4. Brother, printer, 34 years old. R. E., M.  $\frac{1}{24}$ , with V. =  $\frac{1}{16}$ . L. E., M.  $\frac{1}{24}$ , with V. =  $\frac{1}{16}$ . Divergent strabismus of the right eye. Highly developed staphyloma posticum and atrophy of the choroid of both eyes.

*In the second case :*

1. Father, farmer, 71 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Small staphyloma posticum.
2. Mother, 67 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Background of the eyes normal.
3. Brother, merchant, 45 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Small staphyloma posticum. Insufficiency of the interni.
4. Brother, engraver, 32 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Small staphyloma posticum.
5. Sister, married, 37 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Small staphyloma posticum.
6. Sister, 28 years old. M.  $\frac{1}{8}$ , V. =  $\frac{1}{16}$  of both eyes. Small staphyloma posticum and slight insufficiency of interni.

In the other four cases of blindness of both eyes, only the brother of one patient was examined. He was a printer, 35 years old, and had in the right eye M.  $\frac{1}{8}$ , with V. =  $\frac{1}{16}$ , and beginning detachment of retina, while in the left eye there was M.  $\frac{1}{11}$ , with V. =  $\frac{1}{16}$ , highly developed staphyloma posticum and atrophic spots in choroid.



In eight cases of *monocular blindness*, the nearest members of the family were examined.

*First case.*

1. Father, merchant, 59 years old. M.  $\frac{1}{17}$ , V. =  $\frac{1}{30}$  in both eyes. Small staphyloma posticum.
2. Mother, 61 years old. M.  $\frac{1}{10}$ , V. =  $\frac{1}{5}$  of both eyes. Small staphyloma posticum.
3. Son, merchant, 30 years old. M.  $\frac{1}{24}$ , V. =  $\frac{1}{15}$  of both eyes. Small staphyloma posticum. Rarefaction of the choroidal epithelium.
4. Daughter, married, 35 years old. M.  $\frac{1}{18}$ , V. =  $\frac{1}{5}$  in both eyes. Small circumpapillar atrophy of the choroid.

*Second case.*

1. Father, locksmith, 65 years old. M.  $\frac{1}{53}$ , V. =  $\frac{1}{40}$  in both eyes. Small staphyloma posticum.
2. Mother, 59 years old. E. V. =  $\frac{1}{10}$  in both eyes. Background of the eye normal.
3. Daughter, married, 25 years old. R. E., M.  $\frac{1}{24}$ , V. =  $\frac{1}{5}$ . Emmetropia of the left eye, with V. =  $\frac{1}{5}$ . Background of the eyes normal.

*Third case.*

1. Father, shoemaker, 51 years old. M.  $\frac{1}{10}$ , V. =  $\frac{1}{5}$  of both eyes. Small staphyloma posticum.
  2. Mother, 56 years old. R. E., M.  $\frac{1}{18}$ , V. =  $\frac{1}{5}$ . L. E., M.  $\frac{1}{42}$ , V. =  $\frac{1}{30}$  of both eyes. Large staphyloma posticum. Slight divergent strabismus of the left eye.
  3. Son, shoemaker, 22 years old. M.  $\frac{1}{18}$ , V. =  $\frac{1}{5}$  in both eyes.
  4. Son, tailor, 25 years old. M.  $\frac{1}{5}$ , V. =  $\frac{1}{5}$  in both eyes.
  5. Daughter, 23 years old. M.  $\frac{1}{36}$ , V.  $\frac{1}{5}$  in both eyes.
- Very slight staphyloma posticum in the latter three cases.

*Fourth case.*

1. Father, workman, 63 years old. E. V. =  $\frac{1}{5}$  in both eyes.
2. Son, weaver, 36 years old. M.  $\frac{1}{15}$ , V. =  $\frac{1}{5}$  in both eyes. Small staphyloma posticum.
3. Son, weaver, 32 years old. M.  $\frac{1}{5}$ , V. =  $\frac{1}{5}$  in both eyes. Small staphyloma posticum.

*Fifth case.*

1. Father, printer, 61 years old, M.  $\frac{1}{5}$ , V. =  $\frac{1}{5}$  in both eyes. Insufficiency of the interni, large staphyloma posticum, and atropic spots of choroid.

2. Son, printer, 29 years old. M.  $\frac{1}{2}$ , V. =  $\frac{1}{2}$  in both eyes. Large staphyloma posticum.
3. Daughter, seamstress, 26 years old. M. =  $\frac{1}{11}$ , V. =  $\frac{1}{11}$  in both eyes. Small staphyloma posticum.

*Sixth case.*

1. Grandfather, baker, 79 years old. M.  $\frac{1}{20}$ , V. =  $\frac{1}{4}$  in both eyes. Small sclerectasia posterior.
2. Mother, widow, 54 years old. E. V. =  $\frac{1}{15}$  in both eyes.

*Seventh case.*

1. Brother, barber, 44 years old. M.  $\frac{1}{12}$ , V. =  $\frac{1}{4}$  in both eyes. Small staphyloma posticum.
2. Brother, barber, 29 years old. M.  $\frac{1}{15}$ , V. =  $\frac{1}{4}$  in both eyes. Small staphyloma posticum.
3. Sister, shop-girl, 24 years old. Hm.  $\frac{1}{36}$ , V. =  $\frac{1}{6}$  in both eyes.

*Eighth case.*

1. Sister, married, 29 years old. E. V.  $\frac{1}{6}$ . Macule corneae of both eyes. Background of the eyes normal.
2. Sister, married, 35 years old. R. E., M.  $\frac{1}{16}$ , V. =  $\frac{1}{6}$ . L. E., Hm.  $\frac{1}{36}$ , V. =  $\frac{1}{6}$ . Background of both eyes normal.

In the other cases, there was no opportunity of examining either the parents or brothers and sisters. The statements of the patients as to the hereditary circumstances differed. In some cases, it could not be ascertained whether the parents or the brothers or sisters had been near-sighted or not. In other cases, the question as to the myopia, either of the parents or the brothers or sisters, was answered affirmatively.

The investigation as to the myopia of the patients who lost their sight in consequence of detachment of retina gave the following result:

In the six cases of detachment of retina of both eyes, there existed a doubt only in one case as to whether the patient had suffered from highly developed myopia. In all other cases, highly developed progressive myopia was established with certainty.

The twenty-four cases of monocular detachment of retina showed:

M. $\frac{1}{36}$ of the right eye, in 1 case.	M. $\frac{1}{4}$ three times of the right eye,
M. $\frac{1}{11}$ of the right eye, in 1 case.	and twice of the left eye, in 5
M. $\frac{1}{10}$ of the left eye, in 2 cases.	cases.
M. $\frac{1}{8}$ of the left eye, in 1 case.	M. $\frac{1}{8\frac{1}{2}}$ of the left eye, in 3 cases.
M. $\frac{1}{4}$ of the right and left eye, in	M. $\frac{1}{3}$ of the right eye, in 2 cases.
2 cases.	M. $\frac{1}{2\frac{1}{2}}$ of the left eye, in 1 case.
M. $\frac{1}{6\frac{1}{2}}$ of the right eye, in 2 cases.	M. $\frac{1}{2}$ of the right eye, in 1 case.
M. $\frac{1}{2}$ twice of the right and once	
of the left eye, in 3 cases.	

*Among the women there were :*

Weavers' wives, . . . . . 3	Baker's wife, . . . . . 1
Dealer's widow, . . . . . 1	Tiler's wife, . . . . . 1
Merchant's wife, . . . . . 1	Washer-woman, . . . . . 1

*Their ages are :*

29 years, . . . . . 1	From 61 to 75 years, . . . . . 1
From 45 to 60 years, . . . . . 1	

*There were blind :* of both eyes, 2 (53 and 60 years old); of the right eye, 1; of the left, 5.

In the cases of monocular blindness, the refraction of the other eye showed :

M. $\frac{1}{8}$ in 2 cases.	M. $\frac{1}{4}$ in 2 cases.
M. $\frac{1}{2}$ in 1 case.	

Of one case the myopia could not be ascertained. The eye was suffering from cataract, and the statements of the woman were inaccurate.

In both cases of detachment of retina of both eyes, the pre-existence of highly developed myopia could be established with certainty.

The investigation as to the hereditary circumstances gave the following result :

In the two cases of detachment of retina of both eyes, the patients stated that their father was very near-sighted. As to the mother, the answer was affirmative in one case and remained doubtful in the other. In the latter case, as an example of superior power of vision of the family, the grandmother was spoken of as having been able to perform the finest needle-work in her old age without glasses. Here, too, there existed

hereditary predisposition. One patient told us that her brother lost both eyes at the age of 35 years.

In the six cases of monocular detachment of retina, the examination of the nearest members of the family yielded the following result :

*First case.*

1. Mother, farmer's widow, 56 years old. M.  $\frac{1}{24}$ , V. =  $\frac{1}{50}$ . Small sclerectasia posterior of both eyes.

2. Brother, locksmith, 35 years old. R. E., M.  $\frac{1}{6}$ ; L. E., M.  $\frac{1}{12}$ . V. =  $\frac{1}{50}$  of both eyes. Small sclerectasia posterior and insufficiency of the interni.

*Second case.*

1. Brother, copyist, 47 years old. M.  $\frac{1}{25}$ , V. =  $\frac{1}{10}$  of both eyes. Sclerectasia posterior and atrophy of the choroid.

2. Sister, married, 17 years old. M.  $\frac{1}{6}$ , V. =  $\frac{1}{50}$  of both eyes. Small staphyloma posticum.

*Third case.*

1. Brother, 9 years old. Hm.  $\frac{1}{30}$ , V. =  $\frac{1}{50}$  of both eyes.

2. Sister, seamstress, 30 years old. R. E., M.  $\frac{1}{6}$ , V. =  $\frac{1}{50}$ ; L. E., M.  $\frac{1}{6}$ , V. =  $\frac{1}{50}$ . Convergent strabismus of the left eye. Small sclerectasia posterior of both eyes.

Of the fourth and fifth cases the hereditary tendency remained undecided. The parents were dead and had had no other children.

In the sixth case, the patient assured most emphatically that in both families, both on the father's and mother's side, near-sightedness had prevailed.

*Final Result.*

Detachment of retina, consecutive cataract (of both eyes in two cases), in 11 cases.	Detachment of retina, opacities of vitreous (of both eyes in six cases), in 25 cases.
Detachment of retina, atrophy of the eyeball, in 1 case.	Detachment of retina, phthisis of the eyeball, in 1 case.

*F.—Affection of the Optic Nerve.*

46 cases of blindness. Of these affections we have two categories :



a. *The genuine atrophy of the optic nerve*, with 28 cases of blindness: 24 in men, and 4 in women.

*Of the men there were:*

Shoemaker, . . . . .	1	Blacksmiths, . . . . .	4
Weavers, . . . . .	7	Firemen, . . . . .	2
Merchants, . . . . .	2	Cabinetmaker, . . . . .	1
Locksmiths, . . . . .	3	Tailor, . . . . .	1
Plumber, . . . . .	1	Inn-keepers, . . . . .	2

*There were blind:* of both eyes, 20; of the right eye, 2; of the left, 2.

*Their ages were:*

From 25 to 30 years, . . . . .	2	From 46 to 60 years, . . . . .	8
“ 31 to 45 years, . . . . .	14		

In the four cases of monocular blindness, the other eye, too, was suffering from atrophy of the optic nerve. In the two cases of blindness of the right eye, aged respectively 39 and 47 years, the vision of the left eye was  $\frac{9}{7}$  and  $\frac{15}{10}$ . In the two cases of blindness of the left eye, aged respectively 28 and 41 years, the vision of the right eye was  $\frac{15}{200}$  and  $\frac{15}{50}$ .

As to the etiology of atrophy, *excessive indulgence in alcoholic stimulants and tobacco* was proved to be the cause in the cases of three locksmiths, four blacksmiths, two inn-keepers, two firemen, and one merchant.

Suspicion of abuse of alcoholic liquors and of tobacco existed in the cases of one cabinetmaker, one merchant, and two weavers.

The inquiry into the other eight cases yielded no information.

I never had an opportunity of observing cases of genuine amblyopia or amaurosis caused by the exclusive abuse either of liquor or tobacco. In all cases, without exception, both agents were the cause of the affection. In regard to the anamnesis we must be very careful. We seldom obtain a direct confession that alcoholic liquors have been immoderately indulged in. In general, the ideas of such patients in regard to *immoderate use* are very vague. Habitual drunkards most earnestly

assert that they take daily a drink of brandy or beer, but that they are very temperate. The real state of affairs can be learned only by cross-questioning. Only thus the patient is induced to reveal what quantities of liquor he daily consumes. The abuse of tobacco the patient readily acknowledges.

In my sphere of activity, I had frequent opportunity to observe the genuine atrophy of the optic nerve. In relation to the whole number of my patients, the percentage is very high. Of all employments, I found those of locksmiths, blacksmiths, firemen, and weavers to be most prolific in this affection. It is difficult to decide in what degree, in the three former classes, the trade itself, *i. e.*, the prolonged exposure to fire, is to be regarded as the principal cause of the affection, as the abuse of alcoholic liquors and of tobacco is very prevalent among the classes mentioned. But of weavers we are justified to say that their trade, involving excessive exertion of sight from their earliest age, is the main cause of the affection of the optic nerve. The first symptoms of the affection, which usually begin between the ages of 30 and 41 years, manifest themselves in asthenopic troubles. Glasses bought from the optician or the dealer in spectacles afford a slight and transient relief. But soon the glasses do not suit any longer, and the patients are obliged to take at short intervals higher number of glasses, without much avail. In this state, the patient consults the oculist. The complaints of these pale, ill-fed people are so nearly alike in all cases that, with some experience, a sure diagnosis can be made already after the first preliminary questions. The form of atrophy in these cases is not a malignant one. Often we do not only succeed in arresting the morbid process, but in restoring normal vision, with permanent success.

*Of the women there were :*

2 seamstresses, aged, respectively,	1 school-teacher's wife, 43 years old
55 and 59 years.	1 weaver's wife, 61 years old.

The school-teacher's wife was blind of the right eye only. The left eye, suffering, too, from atrophy of the optic nerve, had still vision of  $\frac{1}{50}$ . There were no special causes of the affection.

The seamstresses and the weaver's wife were blind of both eyes. Excessive exertion of vision from earlier age was ascertained as the main cause of blindness in those three cases.

*b. Secondary affections of the optic nerve, in consequence of lesions of the cerebro-spinal nervous system.*

18 cases of blindness: 14 in men, 2 in women, and 2 in children.

*Of the men there were :*

Saloon-keepers, . . . . . 2	Surveyor, . . . . . 1
Factory manager, . . . . . 1	Merchants, . . . . . 2
Silk-weaver, . . . . . 1	Locksmith, . . . . . 1
Grocer, . . . . . 1	Farmer, . . . . . 1
Tailor, . . . . . 1	Tiler, . . . . . 1
Harnessmaker, . . . . . 1	Man-of-letters, . . . . . 1

The morbid process, which always affected both eyes, led in 8 cases to blindness of both eyes, and in 6 cases to monocular blindness.

Of the four patients blind of the right eye, the left eye had vision, respectively, of  $\frac{15}{200}$ ,  $\frac{3}{100}$ ,  $\frac{5}{1000}$ , and  $\frac{2}{1000}$ .

Of the two patients blind of the left eye, the right eye had vision, respectively, of  $\frac{15}{40}$  and  $\frac{15}{200}$ .

The ages of these six patients varied between 20 and 53 years.

In these cases the cause of blindness was :

1. *Concussion of the brain*, caused by falling from a height of 45 feet (case of a tiler 20 years old).

2. *Concussion of the brain and encephalitis*, caused by falling from a steeple (case of a locksmith 25 years old).

3, 4, 5. *Tabes dorsualis* (cases of the two merchants, aged respectively 33 and 45 years ; and of the surveyor, 50 years old).

The ages of the patients blind of both eyes were from 42 to 63 years.

In these the cause of blindness was :

1. *Tabes dorsualis* (case of the factory manager, 42 years old).

2. *Tumor cerebri* (case of a saloon-keeper, 46 years old).

3. *Tabes dorsualis* (case of a saloon-keeper, 49 years old).

4. *Tabes dorsualis* (case of the silk-weaver, 50 years old).

5. *Softening of the brain* (case of the man-of-letters, 50 years old)
6. *Genuine encephalitis* (case of the tailor, 53 years old).
7. *Tabes dorsualis* (case of the grocer, 54 years old).
8. *Progressive paralysis* (case of the harness-maker, 63 years old).

*The morbid process of the eyes was :*

Atrophy of the optic nerve, in 11 cases.	Neuro-retinitis descendens, in 3 cases.
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*Of the women there were :*

1. Merchant's widow, 48 years old, blind of the left eye. The morbid process was atrophy of the optic nerve of both eyes, with V.  $\frac{1}{2}$  of the right eye.

2. Officer's wife, 43 years old, blind of both eyes, in consequence of meningitis basilaris. The morbid process of both eyes was neuro-retinitis descendens.

The two children : shoemaker's child, 3 years old, and workman's child, 4 years old, were blind of both eyes in consequence of tumor of the brain. The morbid process of the eyes was in each case neuro-retinitis.

*G.—Glaucoma.*

This affection caused 41 cases of blindness : 28 in men and 13 in women.

*Of the men there were :*

Pauper in almshouse, . . . . . 1	Baker, . . . . . 1
Joiner, . . . . . 1	Weavers, . . . . . 4
Mason, . . . . . 1	School-teacher, . . . . . 1
Blacksmiths, . . . . . 2	Farmer, . . . . . 1
Merchants, . . . . . 4	Tailors, . . . . . 2
Workmen, . . . . . 4	Organ-grinders, . . . . . 2
Servants, . . . . . 2	Mechanical engineer, . . . . . 1
Designer, . . . . . 1	

*There were blind :* of both eyes, 13; of the right eye, 7; of the left, 8.

*Their ages were :*

From 30 to 45 years, . . . . . 2	From 61 to 70 years, . . . . . 9
" 46 to 60 years, . . . . . 14	" 71 to 80 years, . . . . . 3

Of the patients blind of both eyes, iridectomy was performed only in 9 cases, viz., seven times on both eyes, twice on one eye



only. In three cases, there was a double transverse iridectomy of one eye.

Of the patients blind of one eye, iridectomy was performed in 9 cases, a double transverse iridectomy in 1 case. In 6 cases iridectomy was either refused or neglected.

As to the other eye of the cases of monocular blindness, the statements were as follows:

In 6 cases, where the other eye was suffering from glaucoma, the morbid process was stopped by a timely iridectomy. The vision of these eyes was:  $\frac{1}{10}$  in 1 case,  $\frac{1}{7}$  in 2 cases,  $\frac{1}{4}$  in 1 case,  $\frac{1}{8}$  in 2 cases, with more or less limitation of the field of vision.

In 7 cases, the other eye was perfectly normal, with vision of:

$\frac{1}{12}$ in 1 case.	$\frac{1}{20}$ in 2 cases (with Hm. $\frac{1}{14}$ and $\frac{1}{8}$ ).
$\frac{1}{8}$ in 2 cases.	$\frac{1}{30}$ in 2 cases (with Hm. $\frac{1}{12}$ and $\frac{1}{8}$ ).

In 2 cases with vision of  $\frac{1}{5}$  and  $\frac{1}{30}$  (in the latter case with Hm.  $\frac{1}{8}$ ), there was suspicion of glaucoma.

The blind eyes on which iridectomy had been performed yielded the following facts:

In 6 cases the operation was very defective. The section was in the cornea, the coloboma very small, and the edges of the iris were grown together with the cornea.

In 2 cases the papillary part of the iris had not been excised.

In 4 cases the capsule of the lens had been wounded in the operation, thus giving rise to traumatic cataract.

Six cases showed cystoid cicatrization.

*Of the women there were:*

Seamstress, . . . . .	1	Merchants' wives, . . . . .	2
Shoemaker's wife, . . . . .	1	Weaver's wife, . . . . .	1
Laborers' wives, . . . . .	4	Clerk's wife, . . . . .	1
Laborers' widows, . . . . .	3		

*There were blind:* of both eyes, 3; of the right and of the left eye, each 5.

*Their ages were:*

From 45 to 60 years, . . . . .	3	From 71 to 80 years, . . . . .	2
" 61 to 70 years, . . . . .	8		

Only in one of the cases of blindness of both eyes, iridectomy had been made on one eye.

In the cases of monocular blindness, iridectomy had been performed only six times. In the other four cases iridectomy had been either refused or neglected.

In three of the cases of monocular blindness, the other eye had likewise been suffering from glaucoma.

Here the morbid process had been checked by iridectomy. In those eyes vision was :

$\frac{1}{2}$  in one case, without limitation of field of vision.

$\frac{1}{2}$  in two cases, with limitation of field of vision upwards-inwards; and with Hm.  $\frac{1}{24}$  in one case, and M.  $\frac{1}{8}$  in the other.

In the other patients, the second eye was normal. Five patients had vision =  $\frac{1}{2}$ , with Hm.  $\frac{1}{18}$ ,  $\frac{1}{10}$ ,  $\frac{1}{8}$  in three cases, and with emmetropia in two cases. Two patients had vision =  $\frac{1}{5}$  with M.  $\frac{1}{24}$  in one case, and emmetropia in the other.

In three of the cases of blindness, iridectomy had been performed in a very defective manner; in two, the capsule of the lens had been injured, giving rise to consecutive cataract.

#### *Final Result.*

Glaucoma apoplecticum, in 3 cases.	Glaucoma absolutum, consecutive cataract, anterior staphyloma of the sclera, in 3 cases.
Glaucoma absolutum, with circular posterior synechiæ, in 3 cases.	Glaucoma absolutum, with consecutive cataract, in consequence of lesion of the capsule of the lens during iridectomy, in 6 cases.
Glaucoma absolutum, in 24 cases.	
Glaucoma absolutum, consecutive cataract, in 2 cases.	

#### *H.—Unsuccessful Operations.*

The operations led to blindness in 32 cases: 18 men, 11 in women, and 3 in children.

#### *Of the men there were :*

Workmen, . . . . .	4	Ragman, . . . . .	1
Private gentleman, . . . . .	1	Cabinetmaker, . . . . .	1
Pauper in almshouse, . . . . .	1	Locksmiths, . . . . .	2
Printer, . . . . .	1	Fireman, . . . . .	1
Merchants, . . . . .	2	Farmer, . . . . .	1
Weavers, . . . . .	3		

*Their ages were :*

Between 16 to 40 years, . . . . . 5	Between 61 to 70 years, . . . . . 6
" 46 to 60 years, . . . . . 8	83 years, . . . . . 1

Iridectomy led to blindness of the right eye in one case. Operation of cataract caused blindness in 17 cases : 11 times in the right, and 7 in the left eye (both eyes in one case).

*The women were :*

Factory women, . . . . . 4	Merchants' wives, . . . . . 2
Seamstress, . . . . . 1	Workman's widow, . . . . . 1
Farmer's wife, . . . . . 1	Cabinetmaker's wife, . . . . . 1
Factory girl, . . . . . 1	

*Their ages were :*

From 16 to 45 yeaes, . . . . . 3	From 61 to 75 years, . . . . . 4
" 46 to 60 years, . . . . . 4	

Iridectomy led to blindnes in two cases : of one right and one left eye. Cataract operation caused blindness of 9 cases : 7 right and 4 left eyes (of both eyes in two cases).

*The children were :*

1. Driver's daughter, 10 years old, loss of the right eye, in consequence of dissection of a congenital cataract.
2. Weaver's son, 12 years old, loss of the left eye in consequence of extraction of traumatic cataract.
3. Merchant's son, 14 years old, loss of the left eye in consequence of advancement of external rectus.

*Final Result.*

*a. After operations of cataract.*

Total leucoma of the cornea, closure of the pupil, detachment of retina, in 3 cases.	Irido-cyclitis (of both eyes in two cases), in 11 cases.
Irido-choroiditis absoluta, with closed pupil, in 5 cases.	Phthisis of the eyeball (of both eyes in one case), in 5 cases
	Stump of the eyeball, in 4 cases.

*b. After iridectomy.*

Irido-choroiditis absoluta, atrophy of the eyeball, in 1 case.	Irido-cyclitis, phthisis of the eyeball, in 1 case.
Panophthalmitis, in 1 case.	

*c. After advancement of external rectus.*

Panophthalmitis, in 1 case.

1.—*Unknown Causes.*

37 cases of blindness, of 23 men and 14 women, are mentioned in my diaries, the etiology of which either could not be ascertained at the time of examination, or was not recorded.

*The men were :*

Weavers, . . . . .	3	Painter, . . . . .	1
In blind asylum, . . . . .	1	Butcher, . . . . .	1
Clerks, . . . . .	2	Cabinetmaker, . . . . .	1
Gardener, . . . . .	1	Postmaster, . . . . .	1
Factory men, . . . . .	7	Baker, . . . . .	1
Dyer, . . . . .	1	Organ-grinder, . . . . .	1
Locksmiths, . . . . .	2		

*There were blind :* of both eyes, 2 : of the right eye, 12 : of the left, 9.

*Their ages were :*

From 16 to 30 years, . . . . .	9	From 46 to 60 years, . . . . .	3
" 31 to 45 years, . . . . .	10	63 years, . . . . .	1

*Of the women there were :*

Store-girl, . . . . .	1	Workwomen, . . . . .	4
Weaver's wife, . . . . .	1	Servant-girl, . . . . .	1
Merchant's daughter, . . . . .	1	Nurse, . . . . .	1
Plumber's wife, . . . . .	1	Cutter's daughter, . . . . .	1
Shoemaker's wife, . . . . .	1	Workmen's widows, . . . . .	2

*There were blind :* of the right eye, 9 : of the left, 5.

*Their ages were :*

From 20 to 30 years, . . . . .	8	From 46 to 60 years, . . . . .	3
" 31 to 45 years, . . . . .	2	65 years old, . . . . .	1

*Final Result.*

Phthisis of the eyeball, in 4 cases.	Atrophy of the eyeball, in 6 cases.
Stump of the eyeball (of both eyes in two cases ; the blindness of one case was attributed to some nervous disease), in 6 cases.	Irido-cyclitis, in 2 cases.
Anophthalmus in consequence of enucleation, in 18 cases.	Partly absorbed cataract, with secondary membranous cataract and detachment of retina (perhaps congenital), in 1 case.



*K.—Tumors of the Eye.*

1. *Intraocular tumors* caused 12 cases of blindness, viz.:

*a. Sarcoma of the choroid* caused 7 cases of blindness: 4 in men, and 3 in women.

*The men were:*

1. Cooper, 60 years old. Sarcoma of the right eye. L. E., Em., V. =  $\frac{1}{2}\frac{5}{6}$ .
2. Workman, 25 years old. Sarcoma of the right eye. L. E., M.  $\frac{1}{3}\frac{1}{6}$ , V. =  $\frac{1}{2}\frac{5}{6}$ .
3. Baker, 46 years old. Sarcoma of the left eye. R. E., Hm.  $\frac{1}{2}\frac{1}{6}$ , V. =  $\frac{1}{4}\frac{5}{6}$ .
4. Merchant, 80 years old. Sarcoma of the left eye. R. E., Em., V. =  $\frac{1}{4}\frac{5}{6}$ .

In one case (baker), the other eye was affected by sympathetic ophthalmia. The blind eye presented all the symptoms of an inflammatory glaucoma. Iridectomy produced no improvement. Enucleation of the eyeball corroborated the diagnosis and removed the ophthalmia of the other eye.

All patients were perfectly healthy and had no hereditary disposition.

*Of the women there were:*

1. Waiter's wife, 54 years old. Sarcoma of the right eye. L. E., Em., V. =  $\frac{1}{2}\frac{5}{6}$ .
2. Turner's daughter, 18 years old. Sarcoma of the left eye. R. E., Em., V. =  $\frac{1}{2}\frac{5}{6}$ .
3. Weaver's daughter, 26 years old. Sarcoma of the right eye. L. E., Hm.  $\frac{1}{6}$ , V. =  $\frac{1}{2}\frac{5}{6}$ .

The waiter's wife, perfectly healthy, was the mother of four healthy children. No hereditary disposition.

Both girls were very scrofulous and very poorly developed. The weaver's daughter, 16 years old, had not yet had her menses. Her grandmother on the mother's side, 65 years old, was operated by me for carcinoma of the inferior lid of the left eye.

*b. Glioma of the retina* caused five cases of blindness, *i. e.*, in five children, viz.:

1. Merchant's child, 2½ years old. Glioma of the left eye.
2. Plumber's child, 3 years old. Glioma of the left eye.
3. Cabinet-maker's child, 3 years old. Glioma of the right eye.
4. Workman's child, 5 years old. Glioma of the left eye.
5. Locksmith's child, 6 years old. Glioma of the right eye.

The merchant's child, 2½ years old, was the first-born. The first symptoms of the affection (a peculiar white reflex from the left eye) was observed by the mother at the end of its first year. The right eye was normal, with blue iris. No similar cases of affection had been observed in the families of either parent. A second child had normal eyes.

The plumber's child, 3 years old, last-born, had still four living sisters and brothers with normal eyes. One brother, who died, 3 years old, of inflammation of the brain, was said to have suffered from the same affection. The duration of the affection could not be ascertained. The right eye was normal, with gray iris.

The cabinet-maker's child, 3 years old, last-born, had a brother 10 years old, with normal eyes. No similar cases of affection had been observed in the families of either parent. The first symptoms of the affection were observed by the mother half a year previously. The left eye was normal, with blue iris.

The workman's child, 5 years old, had still three living brothers and sisters. It was the youngest of seven brothers and sisters of the same mother. The latter was operated, some years before, for carcinoma of the breast, and died one year later from relapse. The first symptoms of the eye-disease had been observed by the father at the fourth year of the age of the child. The right eye was normal, with dark-brown iris.

The locksmith's child, 6 years old, was the only issue after a long period of sterility. The parents were healthy. The first symptoms of the affection had been noticed by the mother one year previously. The left eye was normal, with greenish iris.

There was consanguinity of the parents only in one case (plumber).

Only in two cases I had an opportunity to follow up the subsequent history of the children.

1. One year after the enucleation of the eye of the workman's child, multiple glandular tumors developed on the neck and in the inguinal region, in consequence of which the child died.

2. On the merchant's child there appeared, six months after the enucleation of the left eye, a small detachment of retina of the right eye, which developed but very little during the three months it was under my observation. At the end of the year the child died from hydrocephalus.

2. *Extraocular (resp. orbital) tumors* caused six cases of blindness, viz. :

a. *Sarcoma of the orbit* caused five cases of blindness, 3 in men and 2 in women.

*Of the men there were :*

1. Workman, 20 years old. Sarcoma of the left eye. R. E., Em., V. =  $\frac{1}{3}$ .

2. Baker, 41 years old. Sarcoma of the right eye. L. E., Em., V. =  $\frac{1}{5}$ .

3. Brewer, 47 years old. Sarcoma of the right eye. L. E., M.  $\frac{1}{8}$ , V. =  $\frac{1}{10}$ .

In two cases there was exophthalmus with atrophy of the optic nerve; in one case, exophthalmus, suppuration of the cornea, and panophthalmitis.

*Of the women there were :*

1. Seamstress, 22 years old. Sarcoma of the left eye. R. E., Hm.  $\frac{1}{2}$ , V. =  $\frac{1}{8}$ .

2. Weaver's wife, 38 years old. Sarcoma of the left eye. R. E., Hm.  $\frac{1}{16}$ , V. =  $\frac{1}{16}$ .

In both cases there was exophthalmus and atrophy of the optic nerve.

All patients were otherwise perfectly healthy, and there was no hereditary disposition in them.

During the seven years, in the course of which I had an opportunity of observing the seamstress after removal of the tumor, I could not find any trace of a relapse.

b. *Echinococci* in the right orbit caused blindness of the right eye of a child four years old, the son of a dyer. There was exophthalmus and atrophy of the optic nerve.

L.—*Congenital Blindness*

was observed in 8 cases, which I state here only briefly, reserving further particulars for another place.

The different forms of the morbid process causing blindness were as follows :

1. *Keratitis intra-uterina*. Complete opacity of both corneæ with central band-shaped leucoma and posterior synechie. Observed on both eyes of a seven-weeks-old child.

2, 3. *Choroideo-retinitis intra-uterina absoluta*. Observed on both eyes, both in a baker's child, six months old, and in a blacksmith's child, six weeks old.

4-7. *Congenital Anophthalmus*\* observed in :

1. Workman's child, three months old, on the right side.
2. Plumber's child, four weeks old, on both sides.
3. Weaver's child, two weeks old, on the left side.
4. Weaver, 25 years old (father of the former child), on the right side.

8. *Congenital buphthalmus* of the right eye, observed in a shoemaker's child, three weeks old.

M.—*Consecutive blindness, viz., such as was caused either by constitutional diseases or by affection of other organs of the body.*

Of this class we have 35 cases of blindness, the remote causes of which are :

a. *Small-pox*.†

It caused 14 cases of blindness, viz., in consequence of :

1. *Blennorrhœic Conjunctivitis*,

one case of a shoemaker, 35 years old, whose left eye was lost by suppuration of the cornea. The patient had been vaccinated.

\* For further particulars on those four cases of anophthalmus congenitus see *Klinische Monatsblätter für Augenheilkunde*. April, 1877.

† For further particulars see : *Beiträge zur variolösen Ophthalmie* by the author. Elberfeld Martini or Gruettefien, 1874.



*2. Affections of the Cornea,*

13 cases, 4 in men, 6 in women, and 3 in children.

*Of the men there were :*

1 Peddler, 46 years old.	2 Weavers, resp. 48 and 50 years old.
1 Clerk, 25 years old.	

Of these only one had been vaccinated.

*There were blind :* of both eyes, 1 ; of the right eye, 2 ; of the left eye, 1.

*Of the women there were :*

1 Servant girl, 28 years old.	1 Merchant's daughter, 24 years old.
1 Baker's wife, 34 years old.	
1 Weaver's wife, 50 years old.	1 Locksmith's wife, 48 years old.
1 Factory girl, 26 years old.	

Of these only one had been vaccinated.

*There were blind :* of both eyes, 1 ; of the right eye, 3 ; of the left eye, 2.

*Of the children,* all three weavers' children, between the ages of 4 and 10 years, *none* had been vaccinated. There were blind : of the right eye, two ; of the left eye, two.

*Final Result.*

Phthisis of the eyeball, in 3 cases.	Total leucoma of the cornea, consecutive glaucoma, in 1 case.
Atrophy of the eyeball (of both eyes in one case), in 4 cases.	Opaque staphyloma of the cornea (of both eyes in one case), in 2 cases
Stump of the eyeball, in 2 cases.	
Total leucoma of the cornea, staphyloma of the iris, in 1 case.	

*b. Severe Hemorrhages\**

caused four cases of blindness, viz. :

1. Trader, 63 years old. Loss of vision of both eyes immediately after blood-vomiting.
2. Seamstress, 36 years old. Loss of vision of the right eye two weeks after profuse metrorrhagia had been stopped.
3. Merchant's daughter, 24 years old. Gradual loss of vision of the left eye in consequence of profuse epistaxis.

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\* For further particulars on the first three cases, see : *Klinische Monatsblätter für Augenheilkunde.* March, 1877.

4. Baker's wife, 47 years old. Loss of vision of the right eye in consequence of profuse metrorrhagia, caused, according to the diagnosis of a gynecologist, by a fibroid of the uterus. The blindness of the right eye developed through progressive atrophy of the optic nerve. The morbid process occupied the space of one year. Every attack of metrorrhagia was followed by an impairment of vision, while, during the free intervals, the sight of the eye remained stationary, slight fluctuations excepted. The left eye remained normal.

### *c. Puerperal Affections*

led to blindness, through irido-choroiditis metastica, in three cases, viz. :

- Of a driver's wife, 44 years old. Loss of both eyes.
- Of a saloon-keeper's wife, 30 years old. Loss of both eyes.
- Of a cutler's wife, 25 years old. Loss of the right eye.

### *d. Cerebro-spinal Meningitis*

led to blindness of three children, viz. :

- Of a weaver's son, 20 weeks old. Loss of the right eye.
- Of a merchant's son, one year old. Loss of the right eye.
- Of a baker's son, three years old. Loss of both eyes.

### *Final Result.*

Amauratic "cat's-eye," in 1 case.		Atrophy of the optic nerve, slight
Phthisis of the eyeball, amaurotic		phthisis of both eyes, in 1 case
"cat's-eye," in 1 case.		

### *e. Typhoid Fever*

caused blindness in two cases, viz. :

1. P. G., farmer, 40 years old. In the fifth week of the disease, F. made the following notes respecting the right eye: Protrusion of the eyeball, with complete immobility. Chemosis of the conjunctiva of the globe, which surrounds the cornea like a wall. Cornea clear. Tissue of the iris greenish, with serous infiltration. Exudations on the lens. Intraocular pressure increased. Orbit free. Slight pain. Amaurosis. Affection since about 8 days.

2. B. D., workman's wife, 40 years old, recovering from typhoid fever. In the sixth week of the disease, vision of the right eye had become impaired, while otorrhea of the right ear set in. When four weeks afterwards the patient came to me, I made the following notes respecting the right eye :

The exterior of the right eye is normal. Its refracting media are

clear. Pupil normal, when both eyes are open; of medium dilatation, when the left eye is closed. It reacts well by reflex; but does not react consensually even upon concentrated light. Intraocular pressure normal. Amaurosis.—The ophthalmoscope showed *neuritis optica* and *slight infiltration of the retina*.

The right side of the head is very sensitive to palpation. Much headache.

The left eye was normal.

Therapeutic measures were fruitless.

#### *f. Measles*

were said to have caused blindness of a girl six years old: grocer's daughter. The parents stated that their child lost both eyes a year before, while suffering from the measles.

The examination of the eyes gave the following result:

The exterior of the eyes is normal; pupils moderately dilated, immovable; refracting media clear; atrophy of the optic nerve.

#### *g. Heart Diseases*

caused blindness of four cases, viz.:

1. Harness-maker, 67 years old. Blind of the right eye.
2. Merchant, 65 years old. Blind of the right eye.
3. Merchant, 47 years old. Blind of the right eye.
4. Agent, 45 years old. Blind of both eyes.

In the cases of monocular blindness there was *insufficiency of the semilunar valves and stenosis at the aortic orifice* in two cases, complicated with atheromatous degeneration of the arteries.

In the case of blindness of both eyes there was *endocarditis* consequent to acute rheumatism of joints.

In all four cases the background of the eye showed *embolism of the central artery of the retina*.

#### *h. Gonorrhœa*

led to blindness in four cases, the gonorrhœal matter being transferred into the conjunctiva, viz.:

1. Shoemaker, 23 years old. Blind of both eyes. There was *gonorrhœal conjunctivitis and suppuration of both corneæ*. Patient was suffering from gonorrhœa for three weeks. The first symptoms of inflammation of the eyes appeared on the sixth day of the gonorrhœal affection.

2. Grocer's apprentice, 19 years old. Blind of the left eye. There was *gonorrhœal conjunctivitis and total maceration of the cornea* of the left eye. Patient was suffering from gonorrhœa for six weeks and from gonorrhœal conjunctivitis for two weeks.

3. Joiner, 26 years old. Blind of the left eye. Suffering for three weeks from gonorrhœa, and for 8 days from gonorrhœal conjunctivitis of both eyes. The left cornea was totally destroyed. Of the right cornea there were some peripheric infiltrations.

4. Merchant, 35 years old. Blind of the right eye in consequence of gonorrhœal conjunctivitis, caused by self-infection. The eye showed *total leucoma of the cornea and slight atrophy of the eyeball*.

### i. Syphilis

caused blindness in two cases, viz.:

1. G. P., factory man, 49 years old. *R. E.* periosteal growth of the orbit. Highly developed exophthalmus. Choked disc. *Final result: Suppuration of the cornea and phthisis of the eyeball.*

The patient states to have been infected three years previously for the first time, and has *defects in the soft palate and periosteal swellings of the tibiæ*.

2. A. P., workman, 37 years old. Atrophy of both discs. Amaurosis of the right eye. Vision of the left eye —  $\frac{1}{4}$ . In addition, hemiplegia, multiple exostoses of the cranium. Affection six years previous. Very high degree of mercurial cachexia.

### N.—Traumatic Lesions of the Eye

caused 118 cases of blindness: 71 in men, 19 in women, and 28 in children.

#### *Of the men there were:*

Locksmiths, . . . . .	8	Railroad officer, . . . . .	1
Book-binder, . . . . .	1	Engraver, . . . . .	1
Masons, . . . . .	4	Stone-cutters, . . . . .	5
Merchants, . . . . .	3	Soldiers, . . . . .	2
Clerks, . . . . .	3	Copyists, . . . . .	2
Blacksmiths, . . . . .	12	Weavers, . . . . .	2
Factory-men, . . . . .	20	Carrier-boy, . . . . .	1
Dyers, . . . . .	2	Butcher, . . . . .	1
Grocer, . . . . .	1	Turner, . . . . .	1
Joiner, . . . . .	1		

*There were blind:* of both eyes, 3; of the right eye, 32; of the left, 36.



*The ages were :*

From 16 to 30 years, . . . . 40	From 46 to 60 years, . . . . 7
" 31 to 45 " . . . . 21	" 61 to 75 " . . . . 3

*Nature of the Lesions.*

1. Superficial lesions of the cornea, in 4 cases.	4. Perforating wounds of the sclera, in 11 cases.
2. Perforating wounds of the cornea, in 34 cases.	5. Interior lesions of the eye, in 7 cases.
3. Perforating wounds of the cornea and sclera, in 15 cases.	

*Causes of the Lesions.*

*A. In the pursuit of professional duties.*

1. Perforating wounds of the eyeball, caused by sharp instruments, in 5 cases.	2. Foreign bodies penetrating the eyeball, in 21 cases.
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*B. By assault and battery.*

1. Throwing of stones, in 3 cases.	4. Stabbing with knife, in 10 cases.
2. Blows, in 5 cases.	5. Stabbing with dung fork, in 2 cases.
3. Whip-lashes, in 3 cases.	

*C. By accident.*

1. Kick of a horse, in 2 cases.	4. Falling down-stairs, in 4 cases.
2. Injury with penknife (caused by children while playing), in 3 cases.	5. Injury through champagne-cork, in 1 case.
3. Injury with fork (caused by children while playing), in 1 case.	6. Injury through pieces of broken glass (falling against a window pane), in 2 cases.

*D. By scalding.*

1. Scalding, in 1 case.

*E. In the war.*

1. Grape-shot, in 1 case.	2. Bayonet-stab, in 1 case.
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*F. Through explosion.*

1. Percussion cap, in 4 cases.	2. Gunpowder, in 2 cases.
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In one case, in which irido-cyclitis caused the loss of one eye, in consequence of penetrating foreign body, the other one became blind three years afterwards, from sympathetic ophthalmia.

In one case, in which blindness of one eye was caused by a penetrating wound of the cornea and sclera, in consequence of falling down-stairs, the other eye became blind in the same year through irido-cyclitis sympathica.

In one of the cases of lesion through explosion of gun-powder, caused while mining, both eyes were lost through panophthalmitis.

### *Final Result.*

Leucoma corneæ centr. adhærens, membrane in pupil, detachment of retina, in 5 cases.	Defect of the eyeball in consequence of enucleation, in 3 cases.
Leucoma corn. adhær., irido-cyclitis sympathica, in 4 cases.	Panophthalmitis, in 3 cases.
Leucoma corn. adhær., phthisis of the eyeball, in 3 cases.	Rupture of the choroidea with atrophy of the optic nerve, in 3 cases.
Irido-chor. abs., staphyloma of the corn. and sclera, in 2 cases.	Phthisis of the eyeball, in 8 cases.
Irido-chor. abs., closed pupil, detachment of retina, in 6 cases.	Atrophy of the eyeball, in 5 cases.
Irido-cyclitis sympathica (in three cases complicated with staphyloma of the cornea and sclera), in 15 cases.	Stump of the eyeball, in 4 cases.
Phthisis of the eyeball, in 3 cases.	Atrophy of the optic nerve, in 2 cases.
	Detachment of retina and hemorrhages in vitreous, in 2 cases.
	Irido - chor. absoluta, secondary glaucoma, in 3 cases.

### *Of the women there were :*

Inn-keeper's daughter, . . . . . 1	Factory women, . . . . . 4
Nurse, . . . . . 1	Seamstress, . . . . . 1
House-keeper, . . . . . 1	Baker's wife, . . . . . 1
Merchant's wife, . . . . . 1	Servant-girls, . . . . . 1
Workmen's wives, . . . . . 7	

*There were blind :* of both eyes, 1; of the right eye, 10; of the left, 8.

### *The ages were :*

From 20 to 30 years, . . . . . 11	From 46 to 65 years . . . . . 4
" 31 to 45 " . . . . . 4	

### *Nature of the Lesions.*

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Superficial lesion of the cornea, in 1 case.</li> <li>2. Perforating wounds of the cornea, in 10 cases.</li> </ol> | <ol style="list-style-type: none"> <li>3. Perforating wounds of the cornea and sclera, in 4 cases.</li> <li>4. Perforating wounds of the sclera, in 4 cases.</li> </ol> |
|--|---|

*Causes of the Lesions.*

*A. By accident.*

- |   |  |
|---|--|
| <p>1. Foreign bodies penetrating into the interior of the eyeball, in 4 cases.</p> <p>2. Stabbing with penknife (caused by children while playing), in 2 cases.</p> | <p>3. Stabbing with a pair of scissors, in 2 cases.</p> <p>4. Falling against a pointed object, in 1 case.</p> <p>5. Injury through pieces of broken glass, in 1 case.</p> |
|---|--|

*B. By assault and battery.*

- |   |   |
|---|---|
| <p>1. Blows, in 3 cases.</p> <p>2. Stabbing with forks, in 2 cases.</p> | <p>3. Stabbing with knife, in 2 cases.</p> <p>4. Blow with a beer-glass, in 1 case.</p> |
|---|---|

*C. By burning.*

With lime, in 1 case.

The blindness of both eyes was observed in the case of a girl who, four years old, lost her left eye, struck by a piece of broken glass. Ten years afterwards, sympathetic ophthalmia set in in the right eye, causing blindness, notwithstanding the enucleation of the left eye and all subsequent treatment.

*Final Result.*

Irido-cyclitis sympathica, in two cases, complicated with staphylo- loma of the cornea and sclera, in 9 cases.	Phthisis of the eyeball, leucoma corn. adhærens, in 3 cases.
Irido-chor. absoluta with consecu- tive glaucoma, in 2 cases.	Leucoma corn. adhærens, consecu- tive glaucoma, in 2 cases.
Atrophy of the eyeball, in 2 cases.	Defect of the eyeball in conse- quence of enucleation, in 1 case.

*Of the children there were :*

Waiter-boy, . . . . . 1	Merchants' children, . . . . . 3
Joiners' children, . . . . . 4	Drivers' children, . . . . . 2
Tailor's child, . . . . . 1	Weavers' children, . . . . . 3
Grave-digger's child, . . . . . 1	Shoemaker's child, . . . . . 1
Mason's child, . . . . . 1	Workmen's children, . . . . . 9
Blacksmiths' children, . . . . . 2	

*There were blind :* of the right eye, 13 ; of the left, 15.

*Their ages were :*

From 1 to 5 years, . . . . . 10	From 11 to 15 years, . . . . . 5
" 6 to 10 ,, . . . . . 13	

*Nature of the Lesions.*

- |  |   |
|--|---|
| 1. Superficial lesion of the cornea, in 1 case.<br>2. Perforating wounds of the cornea, in 15 cases. | 3. Perforating wounds of the cornea and sclera, in 8 cases.<br>4. Perforating wounds of the sclera, in 4 cases. |
|--|---|

*Causes of the Lesions.**A. Through carelessness.*

- |   |   |
|---|---|
| 1. Exploded percussion-caps penetrating the eye, in 6 cases.<br>2. Explosion of gun-powder, in 3 cases, | 3. Injury with penknife, in 3 cases.<br>4. Injury with fork, in 2 cases.<br>5. Stabbing with a pair of scissors, in 1 case. |
|---|---|

*B. By assault and battery.*

- |                                     |  |
|-------------------------------------|--|
| 1. Throwing with stones, in 3 cases | 2. Stabbing with knife, in 4 cases.<br>3. Blow with a hammer, in 1 case. |
|-------------------------------------|--|

*C. By accident.*

- |  |   |
|--|---|
| 1. Falling against a pointed object, in 3 cases. | 2. Injury by a spinning top, in 1 case. |
|--|---|
3. Blow with brushwood, in 1 case.

*Final Result.*

- |   |  |
|---|--|
| Irido-cyclitis sympathica, phthisis of the eyeball (in one case complicated with staphyloma of the cornea and sclera), in 11 cases.<br>Panophthalmitis, in 3 cases.<br>Irido-chor. absoluta, phthisis of the eyeball (in two cases complicated with staphyloma of the cornea and sclera), in 5 cases. | Atrophy of the eyeball, traumatic cataract, in 2 cases.<br>Traumatic cataract, detachment of retina, in 2 cases.<br>Leucoma corn. adhær., irido-chor. absoluta, in 3 cases.<br>Absence of the eyeball in consequence of enucleation, in 2 cases. |
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A glance into the causes of blindness consequent to the lesions of the eye gives us sufficient reason to establish the fact that, with proper caution, in these cases also the greater part might have been avoided. But we not only meet with carelessness and thoughtlessness of the parents, who give their children cutting or sharp playthings in order to pacify them; not only do we meet with the same recklessness prevailing among the boys, in the manner in which they manage explosive materials, preferring them especially as pastime; but we see the same faults committed, to the same extent, especially



among those classes which, in consequence of their trade, are daily exposed to the dangers of lesion of the eye, and which have daily opportunity to learn from personal experience the serious consequences of such an injury. But, as on one hand persons become familiar with the dangers by which they are surrounded, and consequently underrate them; on the other hand, it is very difficult for them to free themselves from the fetters of routine and old habits. In the first years of my practice at Elberfeld, I endeavored to bring into use the protective mica spectacles, recommended by Cohn of Breslau, among those workmen who are especially exposed to injuries of the eye. My intention was met with unanimous opposition. Even such workmen as had already lost one eye in their occupation could not be induced to wear protective spectacles while working. The one alleged that spectacles were disagreeable to him while at work; the other stated that the use of spectacles drew too much the attention of other workmen upon him. Besides, there existed among all a great portion of fatalism, and they preferred to subject themselves to a risk rather than to overcome a transient discomfort.

Experience is indeed the great teacher of men, but the advance of the knowledge derived from it is very slow against the indolence of the multitude. To point out existing evils and to pave the way for a better future is the pre-eminent duty of the physician. We hope that the labor and pains of experience and science will not prove fruitless, and that in the long centuries before us there will be a time when the principles of a rational hygiene will result in permanent benefits to all classes of society.







